

## REMARKS

Claims 1-6 are pending in the above-identified application.

In the Office Action dated October 29, 2007, the Examiner rejected claims 1-6.

With this Amendment, claims 1 and 4 were amended. No new matter has been introduced as a result of these amendments.

Accordingly, claims 1-6 are at issue.

### **I. Objection To Claims**

The Examiner objected to claims 1 and 4 for failure to provide proper antecedent basis for the term "intermediate layer." Per the Examiner's request, the claims were amended to provide antecedent basis for the term "intermediate layer."

The Examiner also objected to the wording of the phrase "a word line a bit line" in claim 4. Claim 4 was amended to clarify that a word line and a bit line are distinct elements. Specification, Page 27 & Figures 4-7.

Accordingly, Applicants respectfully request that the above mentioned objections be withdrawn.

### **II. 35 U.S.C. § 102 Anticipation Rejection of Claims**

Claims 1 and 3 were rejected under 35 U.S.C. § 102(b) as being anticipated by Gill. (U.S. Patent No. 6,181,537 B1). Applicant respectfully traverses this rejection.

As reflected in amended claims 1 and 4, the claimed invention discloses an intermediate layer that is in-between a pair of ferromagnetic layers. Specification, Figure 1. The first layer is a fixed magnetization layer made of a crystalline ferromagnetic material and is located immediately below the intermediate layer. Specification, Page 9. The second layer is a free magnetization layer made of an amorphous ferromagnetic material and is located immediately above the intermediate layer. Specification, Page 9.

Gill specifically discloses a barrier that is sandwiched by a pair of amorphous layers. Gill, Column 4, lines 31-33, 38-44 & Figure 11. Furthermore, Gill teaches that the crystalline pinned layer is located between an amorphous pinned layer and a pinning layer. Column 6, lines 29-32 & Figure 11. As such, Gill does not disclose or even fairly suggest a barrier located between an amorphous layer and a crystalline layer as reflected in amended claims 1 and 4. Thus, independent claims 1 and 4 are patentable over the cited art, as are dependent claims 2, 3, 5, and 6. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

**III. 35 U.S.C. § 103 Obviousness Rejection of Claims**

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gill. (U.S. Patent No. 6,181,537 B1). Applicant respectfully traverses this rejection.

As reflected in amended claims 1 and 4, the fixed magnetization layer is a crystallization material that is an alloy containing iron, nickel and/or cobalt. Specification, Page 15. Additionally, the amorphous fixed magnetization layer is an amorphous material that is an alloy containing an iron group element and metalloid elements, valve metals and rare earth metals. Specification, Page 21. The composition of the pair of ferromagnetic layers is such that the tunnel magnetic resistive (TMR) ratio is greater than 45%, the coercivity value is less than 6% and the rectangle ratio is greater than 90% which result in an improvement of read and write characteristics. Specification, Pages 9, 39-40.

Gill does not teach or even fairly suggest any of the features reflected in amended claims 1 and 4. Gill specifically teaches an amorphous free layer that is  $\text{Co}_{90}\text{Nb}_{10}$ ,  $\text{Co}_{90}(\text{NbHfFe})_{10}$  or  $\text{Co}_{90}(\text{NbZr})_{10}$ . Gill, Column 5, lines 54-56; Column 8, lines 9-10. Gill also teaches a crystalline layer that is  $\text{Co}_{90}\text{Fe}_{10}$ , NiFe or Co. Gill, Column 5, lines 42-46; Column 8, lines 19-21. Gill does not, however, teach or even fairly suggest a pair of ferromagnetic layers such that the

composition of the layers results in values for the TMR ratio, rectangle ratio and coercivity, which improve read and right characteristics. As such, taken singularly or in combination with the conventional laminated ferri structure, the cited reference fails to teach or suggest all the limitations of claims 1 and 4. Thus claims 1 and 4 are patentable over Gill as are dependent claims 2-3, and 5-6. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

Claims 4-6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatke et al. (U.S. Patent No. 6,842,361 B2) in view of Gill (U.S. Patent No. 6,181,537 B1).

Miyatke et al. discloses a memory element with a fixed magnetization layer located below a tunnel barrier and a free magnetization layer located above the tunnel barrier. Miyatke et al., Column 3, lines 54-59 & Figure 1. Miyatke et al. does not, however, teach or even fairly suggest materials to construct the free magnetization layer and the fixed magnetization layer. Furthermore, as discussed above, Gill fails to teach or even fairly suggest compositions of the free magnetization layer and the fixed magnetization layer, which result in improved read and write characteristics. As such, taken singularly or in combination, the cited references fail to teach or suggest all the limitations of claims 1 and 4. Thus, claims 1 and 4 are patentable over Gill as are dependent claims 2-3 and 5-6. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

**IV. Conclusion**

In view of the above amendments and remarks, Applicant submits that all claims are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

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